

Exhibit C

IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ENTROPIC COMMUNICATIONS, LLC,)
Plaintiff,)
) Case No.:
vs.) 2:22-cv-00125-JRG
)
CHARTER COMMUNICATIONS, INC.,)
Defendants.)
_____)

VIDEO-RECORDED REMOTE DEPOSITION OF
TIMOTHY GALLAGHER
Woodinville, Washington
Wednesday, July 19, 2023; 8:36 a.m.


REPORTED BY:
Victoria A. Guerrero, CSR, RDR, RMR, CRR
Job No. 6018492
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<div>Page 2</div> <div>1IN THE UNITED STATES DISTRICT COURT</div> <div>2EASTERN DISTRICT OF TEXAS</div> <div>3MARSHALL DIVISION</div> <div>4</div> <div>5ENTROPIC COMMUNICATIONS, LLC,)</div> <div>Plaintiff,)</div> <div>6) Case No.:</div> <div>vs.) 2:22-cv-00125-JRG</div> <div>7)</div> <div>8CHARTER COMMUNICATIONS, INC.,)</div> <div>Defendants.)</div> <div>_____)</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15BE IT REMEMBERED that, pursuant to Federal</div> <div>16Rules of Civil Procedure, the deposition of TIMOTHY</div> <div>17GALLAGHER was taken before Victoria A. Guerrero,</div> <div>18California Certified Shorthand Reporter, Registered</div> <div>19Diplomat Reporter, Registered Merit Reporter, and</div> <div>20Certified Realtime Reporter, on Wednesday, July 19,</div> <div>212023, commencing at the hour of 8:36 a.m., the</div> <div>22witness responding to questions by videoconference</div> <div>23from Woodinville, Washington; the questions being</div> <div>24propounded and proceedings reported remotely via</div> <div>25videoconference.</div>	<div>Page 4</div> <div>1INDEX TO EXAMINATION</div> <div>2WITNESS: TIMOTHY GALLAGHER</div> <div>3</div> <div>4EXAMINATION: PAGE LINE</div> <div>By Mr. Cohn 7 19</div> <div>5</div> <div>6</div> <div>7***</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>
<div>Page 3</div> <div>1REMOTE APPEARANCES:</div> <div>2</div> <div>3FOR THE PLAINTIFF:</div> <div>4</div> <div>5K & L GATES LLP</div> <div>KATHERINE L. ALLOR</div> <div>70 West Madison Street, Suite 3300</div> <div>6Chicago, Illinois 60602</div> <div>312.372.1121</div> <div>katy.allor@klgates.com</div> <div>8</div> <div>9FOR THE DEFENDANT:</div> <div>10</div> <div>11ARNOLD & PORTER</div> <div>MARC COHN</div> <div>601 Massachusetts Avenue, NW</div> <div>12Washington, DC 20001</div> <div>202.942.6990</div> <div>marc.cohn@arnoldporter.com</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17ALSO PRESENT:</div> <div>18Terry Weiss, Videographer</div> <div>19Jake Franks, Concierge tech</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>	<div>Page 5</div> <div>1INDEX TO EXHIBITS</div> <div>2TIMOTHY GALLAGHER</div> <div>3Entropic vs. Charter</div> <div>4Wednesday, July 19, 2023</div> <div>5Victoria A. Guerrero, CSR, RPR, RMR, CRR</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10</div> <div>11</div> <div>12</div> <div>13</div> <div>14</div> <div>15</div> <div>16</div> <div>17</div> <div>18</div> <div>19</div> <div>20</div> <div>21</div> <div>22</div> <div>23</div> <div>24</div> <div>25</div>

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1	Wednesday, July 19, 2023; 8:36 a.m.	1	A I don't think so. Not that I recall, 08:38:10
2	Woodinville, Washington	2	anyway. 08:38:12
3	ooOoo	3	Q So let me just run through the ground rules 08:38:14
4	THE VIDEOGRAPHER: Good morning. We are 08:36:20	4	real quick. I'm going to ask you questions. You 08:38:16
5	on the record at 8:36 a.m. on July 19, 2023. 08:36:20	5	are free and encouraged to tell me if you don't 08:38:19
6	Audio and video recording will continue to take 08:36:26	6	understand my question or if it's vague or anything 08:38:22
7	place unless all parties agree to go off the 08:36:30	7	like that. You're not under compulsion to answer 08:38:24
8	record. The quality of the recording depends 08:36:32	8	anything by making assumptions or anything like 08:38:27
9	on the quality of the camera, of the witness, 08:36:34	9	that. So please feel free to say "I don't 08:38:29
10	and the internet connection of the 08:36:37	10	understand your question" or "Can you rephrase it" 08:38:33
11	participants. 08:36:38	11	or "Can you repeat it," that kind of stuff. 08:38:36
12	This is the video-recorded deposition of 08:36:39	12	Does that make sense? 08:38:38
13	Timothy Gallagher in the matter of Entropic 08:36:41	13	A Yes. 08:38:39
14	Communications vs Charter Communications filed 08:36:46	14	Q If you need -- I tend to break every hour. 08:38:40
15	in the United States District Court, Eastern 08:36:48	15	If you need water, coffee, any kind of break, let me 08:38:42
16	District of Texas. Case No. 2:22-cv-00125. 08:36:50	16	know. You're allowed to ask for that, too. I might 08:38:45
17	This deposition is being held via Zoom 08:36:58	17	ask us to kind of finish out a line of questions, 08:38:48
18	remote meeting. My name is Terry Weiss from 08:37:01	18	but we can take a break if you need one. 08:38:52
19	the firm of Veritext Legal Solutions and I'm 08:37:04	19	Every now and then a lawyer might object. 08:38:54
20	the videographer. Our court reporter today is 08:37:08	20	And so I'll ask a question, you might hear something 08:38:57
21	Victoria Guerrero from the firm of Veritext 08:37:10	21	like "Objection. Form" from -- probably Ms. Allor 08:39:00
22	Legal Solutions. 08:37:12	22	because I don't see another counsel on the call. 08:39:08
23	I am not related to any party in this 08:37:12	23	There's no judge here. You're not going to 08:39:10
24	action, nor am I financially interested in the 08:37:15	24	hear "sustained," "overruled," or anything like 08:39:12
25	outcome. Counsel and everyone attending 08:37:17	25	that. Those objections are for the lawyers and the 08:39:14
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1	remotely will now state their appearances and 08:37:20	1	Court to figure out at a later time. 08:39:16
2	affiliations for the record. If there are any 08:37:22	2	So for purposes of today, if you hear an 08:39:18
3	objections to proceeding, please state them at 08:37:24	3	objection you can just go ahead and answer the 08:39:20
4	the time of your appearance beginning with the 08:37:27	4	question after the objection. You don't need to 08:39:24
5	noticing attorney. 08:37:30	5	wait for us to prompt you. You don't need to wait 08:39:25
6	MR. COHN: This is Marc Cohn with Arnold & 08:37:31	6	for anyone to say "go ahead." It will save a lot of 08:39:27
7	Porter in Washington DC for the defendant. 08:37:33	7	time for us to not have to say "go ahead" after each 08:39:30
8	MS. ALLOR: Katie Allor from K & L Gates 08:37:38	8	objection. 08:39:33
9	on behalf of plaintiff Entropic Communications, 08:37:41	9	That said, I might ask a couple bad 08:39:34
10	LLC. 08:37:42	10	questions today. If I ask a question, there's an 08:39:38
11	THE VIDEOGRAPHER: Will the court reporter 08:37:45	11	objection, you don't understand my question, then 08:39:40
12	please swear in the witness. 08:37:45	12	just tell me that you don't understand it or ask me 08:39:43
13	ooOoo 08:37:46	13	to repeat it. 08:39:45
14	Whereupon, TIMOTHY GALLAGHER, having first 08:37:46	14	Does that make sense? 08:39:46
15	been sworn by the California Certified 08:37:46	15	A Yes. Got it. 08:39:48
16	Shorthand Reporter, testified under oath as 08:37:46	16	Q I'm going to show you some documents today 08:39:49
17	follows: 08:37:46	17	through the Exhibit Share. I'm hoping that you are 08:39:52
18	08:37:46	18	able to download them and have control over which 08:39:55
19	EXAMINATION 08:37:47	19	page you're looking at. So please let me know if 08:39:59
20	08:37:47	20	you can't do that. I want you to be able to have 08:40:02
21	BY MR. COHN: 08:38:02	21	the freedom to look at other parts of the document 08:40:05
22	Q Good morning, Mr. Gallagher. 08:38:05	22	if you need to. 08:40:07
23	A Good morning. 08:38:06	23	Does that make sense? 08:40:08
24	Q Thank you for being with us today. 08:38:06	24	A Sure. 08:40:09
25	Have you given deposition testimony before? 08:38:08	25	Q Okay. Then I have to ask this of 08:40:10

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1	bandwidth looks like half. But when you	09:54:41	1	Q Using two ADCs to digitize the I and the Q	09:57:56
2	process them in quadrature you get the full	09:54:43	2	signals, was that something new that you guys had	09:58:01
3	bandwidth. At least that's what I think	09:54:47	3	come up with? Or was that something that had been	09:58:03
4	they're trying to say here. I haven't looked	09:54:50	4	known for a time?	09:58:05
5	at this in a long time.	09:54:53	5	A No. That was pretty standard signal	09:58:07
6	Okay. Do you have other questions?	09:55:06	6	processing. This concept of having a mixer and then	09:58:09
7	BY MR. COHN:	09:55:13	7	IQ sampling, I had seen that many years before I was	09:58:12
8	Q Yeah. I'm thinking of a follow-up.	09:55:14	8	at MaxLinear.	09:58:15
9	So each of the ADCs are digitizing half the	09:55:17	9	Q Okay. Is that known as quadrature?	09:58:17
10	spectrum in terms of bandwidth?	09:55:21	10	A Yeah. Quadrature sampling sometimes	09:58:20
11	A I guess you can think of it that way. It's	09:55:30	11	referred to that, yeah.	09:58:25
12	not quite technically correct. Yeah, you can kind	09:55:32	12	Q When you said the radio front end	09:58:32
13	of think of it that way.	09:55:40	13	architecture of this '362 patent was used in the	09:58:33
14	Q Was it your understanding that this device	09:55:45	14	so-called wideband MaxLinear products, you mean the	09:58:36
15	was meant to digitize the entire spectrum being	09:55:47	15	ones that had the 96 or the 192 megahertz sampling	09:58:39
16	received at the RF input?	09:55:50	16	rate?	09:58:42
17	A This looks like the architecture of the	09:55:56	17	A Those bandwidths, yes. Process those	09:58:45
18	earlier product line where we were digitizing on the	09:55:59	18	bandwidths. What I recall is -- I don't recall	09:58:47
19	order of 100 megahertz. Although, there's no reason	09:56:07	19	there being -- there were two parallel paths, each	09:58:51
20	you couldn't use the same sort of architecture to	09:56:10	20	having 100 megahertz bandwidth. Something like	09:58:55
21	digitize the entire spectrum. In the end we didn't	09:56:12	21	that. Those are the very early ones I worked on in	09:58:59
22	use this in our products for the so-called full	09:56:16	22	2010 and '11.	09:59:01
23	spectrum products, did not use this architecture.	09:56:20	23	Q And at least with the example you see in	09:59:49
24	Q The MaxLinear full spectrum products did	09:56:25	24	this patent, it doesn't show the radio front end	09:59:51
25	not use the architecture in this '362 patent; is	09:56:28	25	digitizing the entire spectrum at the RF input,	09:59:54
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1	that what you remember?	09:56:34	1	right? Just a portion of it?	09:59:58
2	MS. ALLOR: Object to the form.	09:56:37	2	A Right. That's what I see in the figures	10:00:02
3	THE WITNESS: I'm looking at the other --	09:56:41	3	and so on, yes.	10:00:05
4	to see if the other figures are all kind of the	09:56:42	4	Q Okay.	10:00:09
5	same.	09:56:45	5	A Although, just to be clear, there's nothing	10:00:15
6	So there are aspects that are -- that were	09:56:50	6	restrict -- I mean, you could use this architecture	10:00:19
7	used and other aspects that are different in	09:56:53	7	to capture the entire spectrum. It's just that it	10:00:22
8	the products that I recall.	09:56:56	8	doesn't really talk about it. I haven't looked at	10:00:25
9	BY MR. COHN:	09:56:58	9	the claims, but it doesn't show it in the figures.	10:00:27
10	Q Okay. What aspects that you see in the	09:56:58	10	Q Let's look at Gallagher Exhibit 4.	10:00:51
11	'362 patent were used in the MaxLinear product that	09:57:02	11	(Exhibit 4, US Patent 10,135,682 B2, was	10:00:56
12	you remember?	09:57:05	12	marked.)	10:00:56
13	A So this, what's called IQ sampling, where	09:57:08	13	BY MR. COHN:	10:00:57
14	you have two ADCs, that's the architecture we used	09:57:10	14	Q Which, for the record, is US Patent	10:00:57
15	for the so-called wideband products. The ones that	09:57:13	15	10,135,682 B2.	10:00:58
16	preceded, that came before the so-called full	09:57:17	16	A Okay.	10:01:10
17	spectrum.	09:57:19	17	Q Do you see that you're the third listed	10:01:16
18	Then the full-spectrum capture ones we had	09:57:23	18	inventor on this patent?	10:01:19
19	somewhat similar or we shared a lot of the concepts	09:57:28	19	A Correct.	10:01:20
20	of the digital front end. It wasn't identical, but	09:57:33	20	Q Do you remember what your contribution was	10:01:21
21	a lot of similar ideas.	09:57:36	21	to the -- well, let me back up.	10:01:23
22	Q The radio front end was different for the	09:57:42	22	Is this one of the patents you reviewed	10:01:25
23	full spectrum products than what's shown in this	09:57:44	23	before today?	10:01:27
24	patent, right?	09:57:47	24	A Yes. I spent less time on this one than	10:01:35
25	A Yes. That's correct.	09:57:48	25	the other two, but I did look at it briefly.	10:01:37

<p style="text-align: right;">Page 58</p> <p>1 A I was not really involved in those sorts of 10:16:50 2 discussions. I remember talk of that kind of thing, 10:16:52 3 but it wasn't really my area of, you know, focus or 10:16:56 4 expertise. 10:17:01 5 I think you're talking about whether you're 10:17:02 6 required to license the patent or provide the patent 10:17:07 7 license-free or -- I remember there were several 10:17:12 8 policies that were being discussed between various 10:17:15 9 different standards bodies. But I don't remember, 10:17:19 10 you know, specifically with DOCSIS what the rules 10:17:22 11 were there. 10:17:26 12 MR. COHN: Okay. I will pass the witness. 10:17:58 13 MS. ALLOR: I don't have any questions for 10:18:02 14 Mr. Gallagher. 10:18:03 15 MR. COHN: All right. 10:18:06 16 THE VIDEOGRAPHER: Okay. This concludes 10:18:11 17 today's deposition of Timothy Gallagher. We're 10:18:13 18 now going off the record. The time is 10:18. 10:18:16 19 MR. COHN: Thank you, Mr. Gallagher. 10:18:20 20 (Proceedings ended at 10:18 a.m.) 21 (Signature reserved.) 22 23 24 25</p>	<p style="text-align: right;">Page 60</p> <p>1 Katherine L. Allor, Esq. 2 katy.allor@klgates.com 3 July 21, 2023. 4 RE: Entropic Communications, LLC v. Charter Communications, 5 Inc., et al 6 7/19/2023, Timothy Gallagher (#6018492) 7 The above-referenced transcript is available for 8 review. 9 Within the applicable timeframe, the witness should 10 read the testimony to verify its accuracy. If there are 11 any changes, the witness should note those with the 12 reason, on the attached Errata Sheet. 13 The witness should sign the Acknowledgment of 14 Deponent and Errata and return to the deposing attorney. 15 Copies should be sent to all counsel, and to Veritext at 16 cs-ny@veritext.com. 17 Return completed errata within 30 days from 18 receipt of testimony. 19 If the witness fails to do so within the time 20 allotted, the transcript may be used as if signed. 21 22 Yours, 23 Veritext Legal Solutions 24 25</p>
<p style="text-align: right;">Page 59</p> <p>1 REPORTER'S CERTIFICATE 2 I, VICTORIA A. GUERRERO, California Certified Shorthand 3 Reporter, Registered Diplomat Reporter, Registered Merit 4 Reporter, Certified Realtime Reporter, do hereby certify 5 that, pursuant to Federal Rules of Civil Procedure, TIMOTHY 6 GALLAGHER appeared remotely before me at the time and place 7 mentioned in the caption herein; that the witness was, by 8 me, first duly sworn/affirmed under oath and examined upon 9 oral interrogatories propounded by counsel; 10 that said examination together with the testimony of 11 said witness was taken down by me in stenotype and 12 transcribed through computer-aided transcription; I further 13 certify that I am not a relative or employee of any attorney 14 of the parties, nor financially interested in the action; 15 and the foregoing transcript, pages 1 through 58, 16 review not requested by the witness or a party, constitutes 17 a full, true, and correct record of such testimony adduced 18 and oral proceedings had and of the whole thereof. 19 WITNESS MY HAND AND DIGITAL SIGNATURE this Friday, July 20 21, 2023. 21  22 23 Victoria A. Guerrero, CSR, RDR, RMR, CRR 24 Oregon CSR No. 14-0428 (exp. 9-30-2024) 25 Washington CCR No. 3293 (exp. 3-15-2024) 26 California CSR No. 8370 (exp. 3-15-2024) 27 Hawaii CSR No. 490 (exp. 12-31-2023)</p>	<p style="text-align: right;">Page 61</p> <p>1 Entropic Communications, LLC v. Charter Communications, Inc., et 2 al 3 Timothy Gallagher (#6018492) 4 E R R A T A S H E E T 5 PAGE ____ LINE ____ CHANGE ____ 6 REASON ____ 7 PAGE ____ LINE ____ CHANGE ____ 8 ____ 9 REASON ____ 10 PAGE ____ LINE ____ CHANGE ____ 11 ____ 12 REASON ____ 13 PAGE ____ LINE ____ CHANGE ____ 14 ____ 15 REASON ____ 16 PAGE ____ LINE ____ CHANGE ____ 17 ____ 18 REASON ____ 19 PAGE ____ LINE ____ CHANGE ____ 20 ____ 21 REASON ____ 22 ____ 23 ____ 24 Timothy Gallagher Date 25</p>

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